ABSTRACT

A dual structure for a multiplexing section extended to an OSU is obtained without adding a dynamic function, such as an optical switch, to a W-MULDEM. The W-MULDEM of an optical wavelength division multiplexing access system divides, among ports corresponding to the individual ONUs, downstream optical signals having wavelengths $\lambda d1$ to λdn, which are received along a current-use optical fiber, or downstream optical signals having wavelengths $\lambda d1+\Delta\lambda$ to $\lambda dn+\Delta\lambda$, which are received along a redundant optical fiber. The W-MULDEM also multiplexes, for the port that corresponds to the current-use optical fiber or the redundant optical fiber, upstream optical signals having wavelengths $\lambda u1$ to λun or wavelengths $\lambda u1+\Delta\lambda$ to $\lambda un+\Delta\lambda$, which are received along optical fibers corresponding to the ONUs. A wavelength difference between the downstream optical signal and the upstream optical signal that are consonant with each ONU is defined as an integer times the FSR of an AWG.